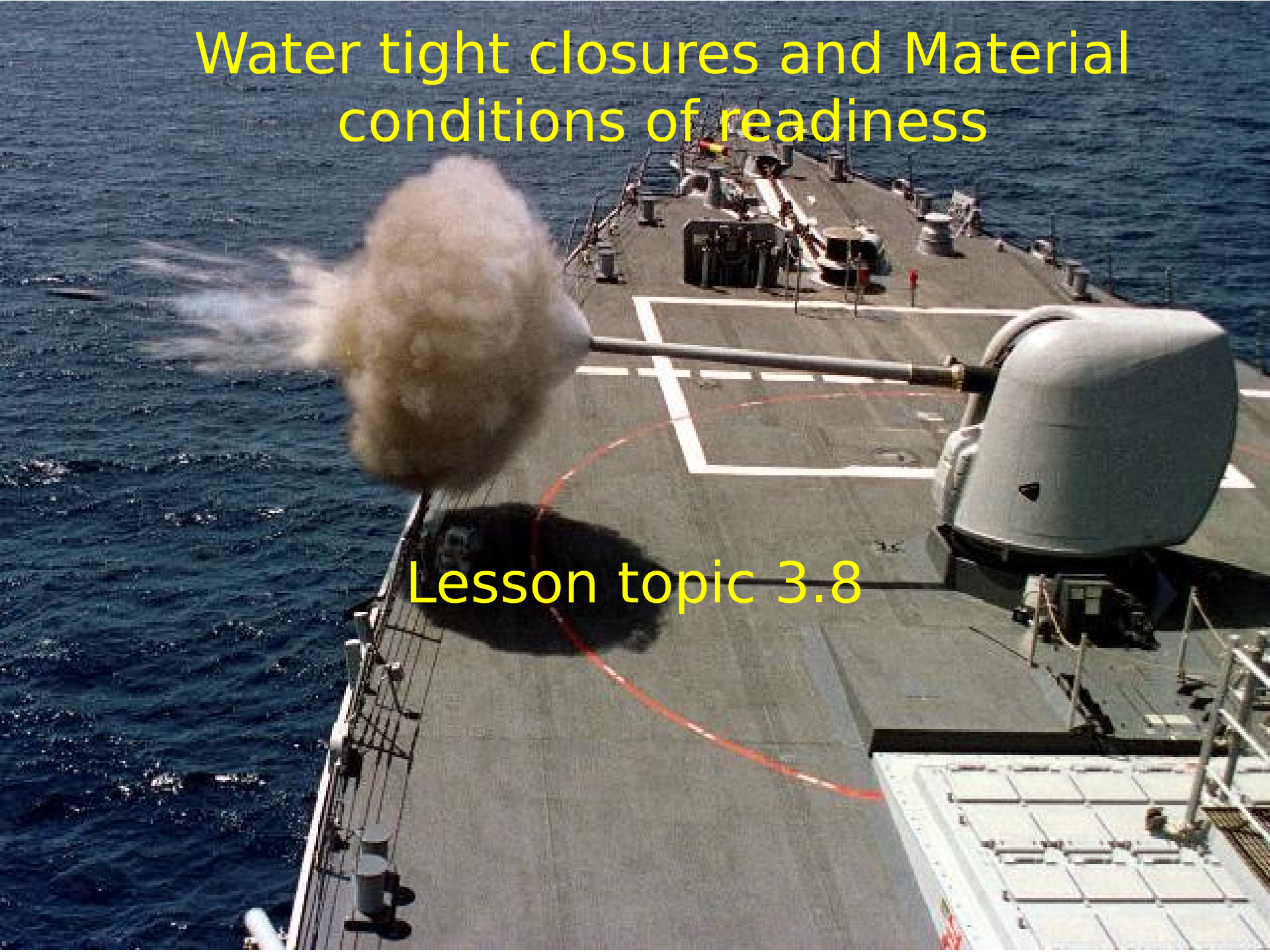
Water tight closures and Material conditions of readiness



Lesson topic 3.8

Enabling Objectives

1. Describe the types of watertight closures and their purpose and characteristics
2. Describe the purpose and use of compartment check off list and the closure log for Material conditions of readiness

Functions of watertight closures

- Watertight integrity is reduced by
  - Enemy action
  - Storm damage
  - Collision
  - Stranding
  - Negligence
- More Watertight compartments/subdivisions the greater the ship's resistance to sinking

Degrees of tightness

- Oiltight (OT)
  - Highest degree of tightness
  - Built to prevent leakage of petroleum products
- Watertight (WT)
  - Built so there will be no leakage of water at a specified height or depth
- Airtight (AT)
  - Built so that if air pressure is put into the space, the pressure will only drop a specified amount

Fire Zones (FZ)

- Physical boundaries designed to retard the passage of fire & smoke
- Fire zone boundaries continue from the main transverse bulkheads through the superstructure
- Protected with fire retarding insulation, insulating paint, gaskets & other material designed to retard the spread of flame & smoke

Fire Zones (FZ)

- New ships, ventilation systems do not cross the boundaries
- Fire zone are at least fume tight
- Ships over 220 feet in length have FZ
- Distance between FZ is never more than 131’
- FZ are indicated by the letters FZ

Types, Purpose, Characteristics, and Locations of Watertight Closures/Fittings

- Door, hinged metal panel closing a bulkhead opening
- Individually Dogged Watertight Door (WTD)
  - Individual dogs, Between 4 and 12 dogs

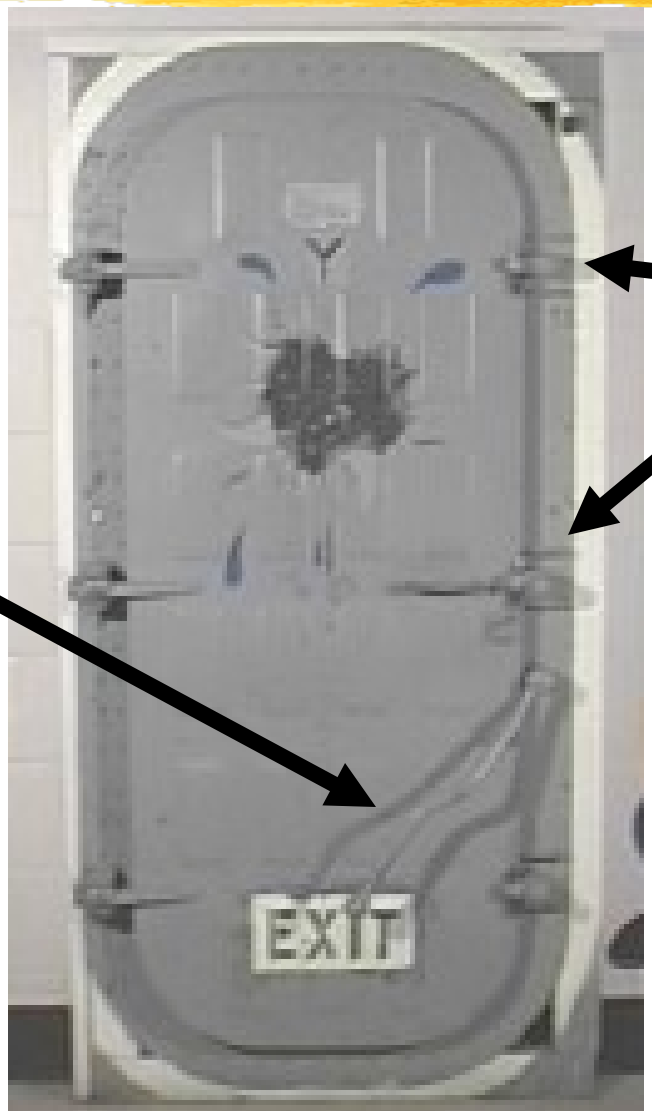
WTD

Individual dogs

Types, Purpose, Characteristics, and Locations of Watertight Closures/Fittings

- Quick-Acting Watertight Door (QAWTD)
  - Door is secured using a single lever or handwheel which operates all dogs
- Ballistic doors
  - Designated as armor closures, intended to resist the direct impact of projectiles

QAWTD



Handle

Dogs

Types, Purpose, Characteristics, and Locations of Watertight Closures/Fittings

- Joiner doors
  - Structural strength, ballistic qualities & water-tightness are not required
- Ellison balanced door
  - Used in an area where there is a pressure drop between two spaces
  - Engine rooms

Ellison balanced door

- Designed for short radius opening
- Ideal for escape trunk use
- Capability to withstand explosions without being blown off hinges
- Spring loaded & hydraulically operated

Types, Purpose, Characteristics, and Locations of Watertight Closures/Fittings

- Hatch, hinged metal cover closing a deck or platform opening
- Watertight Hatches (WTH)
  - Individually-dogged or quick-acting type
- Counter-balanced watertight hatch
  - Counter-weight & spring assembly to provide mechanical advantage

Types, Purpose, Characteristics, and Locations of Watertight Closures/Fittings

- Scuttle, hinged metal cover, circular in shape, installed in a deck or bulkhead opening
- Quick-Acting Watertight Scuttle (QAWTS)
  - Single handwheel operates all dogs
  - Mounted flush with the deck or on a raised coaming

Scuttle

Scuttle

SAFETY

SAFETY

SAFETY

Types, Purpose, Characteristics, and Locations of Watertight Closures/Fittings

- Deck Drain Valves, Metal closure located in galley, sanitary and designated working spaces
  - Gravity drainage of water from spaces served by the ship's CHT system
  - May be routed directly overboard
  - Closure devices during general quarters to prevent back-flooding

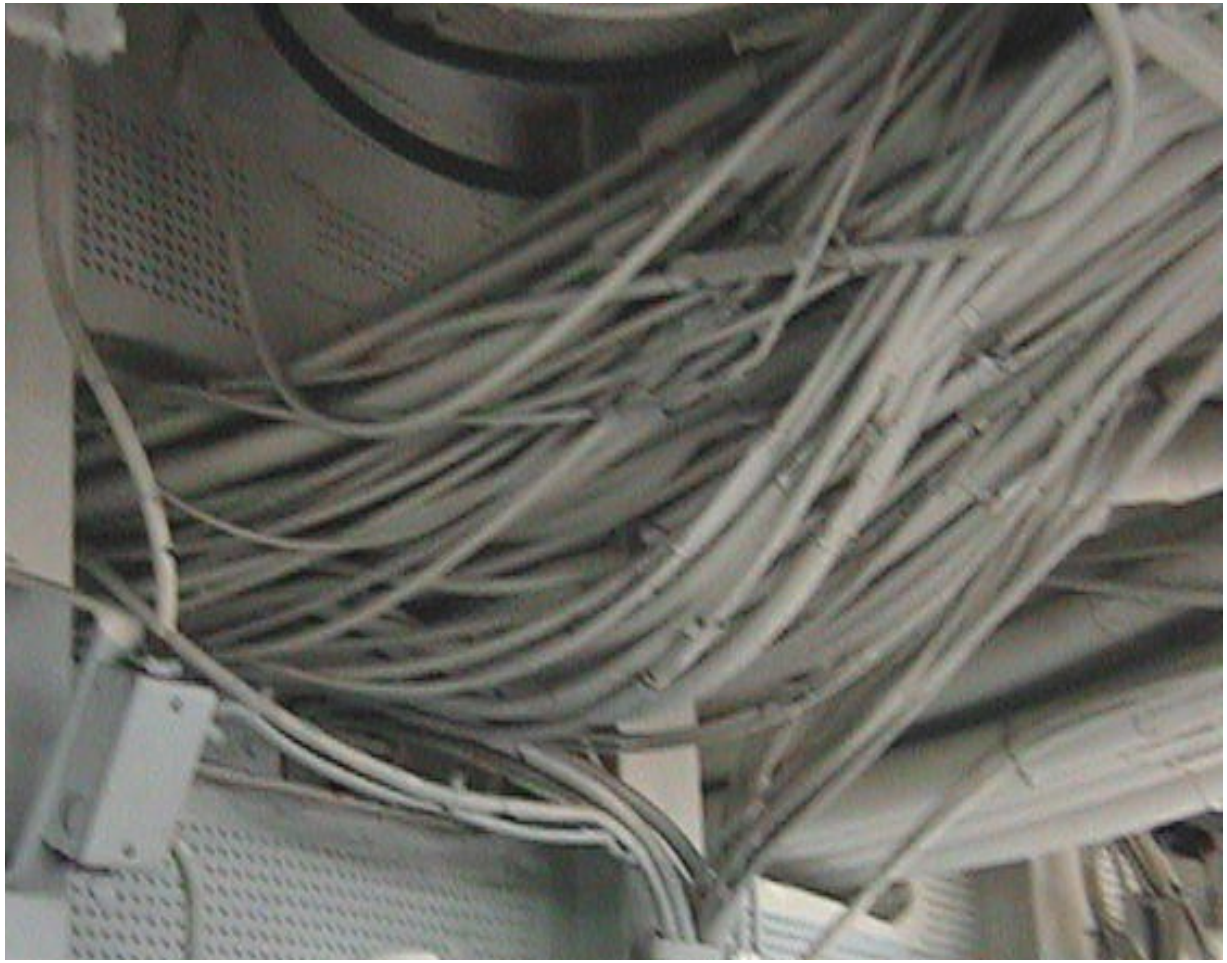
Miscellaneous Closures

- Manhole cover, round/oval metal cover secured by bolts or studs to a deck or bulkhead
- Air-ports, (AP), (portholes), Round, rectangular or square closures located in the superstructure for visual and ventilation purposes
- Air test fitting/caps, metal pipe cap threaded onto a short pipe nipple

Miscellaneous Closures

- Stuffing Tube (SFT), provides a watertight penetration for electric cables
- Multi-cable transit frame, provides watertightness around a nest of electric cables

Multi cable transit frame



Material Conditions of Readiness

- A system of progressive steps through which they obtain the battle condition in which there is the maximum practical degree of watertight, airtight and fume tight integrity

Material Conditions of Readiness

- Ships maintain different material conditions of readiness
  - Improbable, No chance of anything happening
  - Probable, Chance of something could happen
  - Imminent, It's going to happen

Material Conditions of Readiness

- Ships operate under three material conditions
  - X-ray
  - Yoke
  - Zebra
- Maximum degree of is not maintained at all times

Material Conditions of Readiness

- Modifications and special settings were devised to meet specific needs
  - Circle X-ray
  - Circle Yoke
  - Circle Zebra
  - Dog Zebra
  - William
  - Circle William

DC Material Condition Closure Log

- Provides an accurate, up-to-date record of the status of the ship's material condition
  - Lists fittings violating the prescribed material condition

DC Material Condition Closure Log

- Maintained at all times,records the following
  - Number/type of fitting
  - Classification
  - Date & time fitting was changed
  - Estimated time fitting will be open
  - Name & rate of person granting permission
  - Date & time the fitting returned to set material condition

Responsibility for conditions

- In port & normal underway
  - Division which has responsibility of space
- General Quarters
  - Repair party which is responsible for the area

DC Material Condition Closure Log

- Maintained in
  - DC Central, normally
  - May be maintained on Bridge/Quarterdeck
  - Kept on file for six months
- Conditions are set at Beginning and end of each work day or as directed
  - Set by division duty petty officer or DCPO

Compartment Check-Off Lists

- CCOL near each access to show which doors, hatches, and other fittings in that compartment
- Lists the division responsible for setting material conditions

Compartment Check-Off Lists

- Itemized list indicating
  - All classified closures/fittings
  - DC & fire fighting systems & equipment
- Master copy
  - Hard copy & backup disc if computerized, is maintained by the DCA in DC Central

Compartment Check-Off Lists

- Compartment copy
  - Posted near entrance to the space
- Duplicate Copy
  - Posted at each entrance to space where compartments have more than one entrance separated by more than 10 feet
  - Must be clearly labeled as "duplicate"

Compartment Check-Off Lists

- Partial Copy
  - Posted in alcoves, recessed area of a compartment
  - Must be clearly labeled as Partial
- All CCOL's must have a page number (e.g., 1 of 3) to ensure there is a complete list posted

Summary and Review

- Functions of Watertight Closures
- Types, Purpose, Characteristics, and Locations of Watertight Closures/Fittings
- Material Conditions of Readiness
- Purpose and use of DC Material Condition Closure Log
- Purpose and use of Compartment Check-Off Lists